

REMARKS/ARGUMENTS

Applicant has carefully reviewed and considered the Notice of Non-Compliant Amendment mailed on March 1, 2006, and the references cited therewith.

Claims 1, 3, 9, 11, 28, 30, 34, and 36 are amended, claims 2, 10, 15-27, 31-33, and 35 are canceled, claims 4-6, 12-13, and 37-39 are withdrawn, and no claims are added; as a result, claims 1, 3-9, 11-14, 28-30, 34, 36, and 40 are now pending in this application.

Election/Restrictions

Claims 1, 7-9, 14, 28-30, 34 and 40 were withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a non-elected species which calls for a single-phase crystalline form selected from the group consisting of GaO and Ga₂O, there being no allowable generic or linking claim. Election was made without traverse of species 1 drawn to gallium oxide including a single-phase crystalline form of Ga₂O₃.

Applicant erred in the previous response to the October 18, 2005, Office Action by presenting claims directed to a non-elected species. Applicant respectfully requests the Examiner to allow the present response to address the elected "gallium oxide including a single-phase crystalline form of Ga₂O₃" that was the subject of the October 18, 2005, Office Action. That is, Applicant respectfully requests that claims 1, 7-9, 14, 28-30, 34 and 40 not remain withdrawn from further consideration and that the Examiner allows these claims to be the subject for amendment and remarks in the present response.

Information Disclosure Statement

Applicant submitted a complete copy of reference 8Q (Villora, E.G., et al., "Infrared Reflectance and Electrical Conductivity of B-Ga₂O₃", Phys. Stat. Sol. (a), Vo. 193, No. 1, pp. 187-195 (2002)) for consideration in the Information Disclosure Statement mailed March 12, 2004. Additionally, Applicant provided copies of foreign patent documents, WO 02/15233, EP 1306858, and EP 1367657 for consideration in the Information Disclosure Statement mailed June 13, 2005.

Applicant respectfully requests that a copy of the 1449 Form, listing all references that were submitted with the Information Disclosure Statement filed on March 12, 2004 and June 13, 2005, marked as being considered and initialled by the Examiner, be returned with the next official communication.

§ 112 Rejection of the Claims

Claim 30 was rejected under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicant regards as the invention.

Applicant has amended claim 30 to depend from claim 29, which recites “a physical vapour deposition technique”, thereby conferring proper antecedent basis.

§ 102 Rejection of the Claims

Claims 1, 7-9, 14, 28-30, 34, and 40 were rejected under 35 USC § 102(b) as being anticipated by Cillessen, et al. (U.S. Patent No. 5, 744, 864). Applicant respectfully traverses the rejection as follows.

The Cillessen reference appears to describe, “The dopant atoms are attuned to the covalent oxides used. Dopant atoms such as Sb, F, or Cl may thus be used when SnO₂ is the covalent oxide, Sn dopant atoms for In₂O₃, and Ga dopant atoms for ZnO as the oxide.” (Col. 2, lines 25-29; also see col.5, lines 54-60). Cillessen does not show any gallium oxides doped with any atoms; thus, Cillessen does not show a single-phase crystalline gallium oxide Ga₂O₃ with dopant selected from a group consisting of oxygen vacancies, Si, Ge, Sn, and N.

In contrast, Applicant’s independent claims 1 and 34, as amended, recite, “a channel contacting the drain electrode and the source electrode, wherein the channel includes a single-phase crystalline gallium oxide Ga₂O₃ with dopant selected from a group consisting of oxygen vacancies, Si, Ge, Sn, and N”.

Support for the amendment of claims 1 and 34 to recite the specified dopants is found in the specification of the present disclosure as originally filed. Specifically, the specification recites, “Doping of one or more of the layers (e.g., the channel illustrated in Figure 2) may also be accomplished by the introduction of oxygen vacancies and/or substitution of aliovalent elements such as Si, Ge, Sn, F,

and N.” (Page 8, lines 30-33). Although, as previously stated, Cillessen describes no dopants to be used with any gallium oxides, Applicant has removed F from the group of dopants recited in claims 1 and 34, as amended, in the interest of advancing prosecution of the present application.

Independent claim 9, as amended, recites:

means for carrying electron flow to electrically couple the drain electrode and the source electrode, wherein the means for a channel includes means for a single-phase crystalline form of Ga₂O₃ with dopant selected from a group consisting of oxygen vacancies, Si, Ge, Sn, and N;

In addition, independent claim 28, as amended, recites:

providing a precursor composition including one or more compounds of a gallium precursor compound, wherein the means for a channel includes means for a single-phase crystalline form of Ga₂O₃ with dopant selected from a group consisting of oxygen vacancies, Si, Ge, Sn, and N;

As such, Applicant respectfully submits that each and every element and limitation of independent claims 1, 9, 28, and 34, as amended, is not present in the Cillessen reference. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the 102 rejection of independent claims 1, 9, 28, and 34, as well as those claims that depend therefrom.

§ 103 Rejection of the Claims

Claims 2-3, 10-11, 35, and 36 were rejected under 35 USC § 103(a) as being unpatentable over Cillessen, et al. (U.S. Patent No. 5, 744, 864) in view of Ueda, et al. (reference 7Q). Applicant respectfully traverses the rejection as follows.

Claims 2-3, 10-11, 35 and 36 depend from independent claims 1, 9, and 34, respectively. Applicant respectfully submits that independent claims 1, 9, and 34, as amended, are in condition for allowance. From Applicant’s review of the Ueda reference, the reference does not cure the deficiencies of the Cillessen reference. That is, Ueda appears to describe, “[t]he anisotropy of electrical and optical properties in β-Ga₂O₃ single crystals.” (Page 935, col. 2, lines 6-7). Ueda does not describe, teach or suggest, “Ga₂O₃ with dopant selected from a group consisting of oxygen vacancies, Si, Ge, Sn, and N”, as recited in independent claims 1, 9, and 34,

as amended. Ueda appears to teach away from doping β -Ga₂O₃ single crystals by describing "the band gap of the undoped semiconductor". (Page 935, col. 1, lines 3-4).

As such, Applicant respectfully submits that each and every element of independent claims 1, 9, and 34 is not shown in the Cillessen and Ueda references, either independently or in combination. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the 103 rejection of dependent claims 2-3, 10-11, 35 and 36 which depend therefrom.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney Donald J. Coulman at (541) 715-1694 to facilitate prosecution of this matter.

At any time during the pendency of this application, please charge any additional fees or credit overpayment to the Deposit Account No. 08-2025.

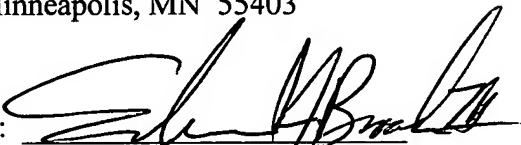
CERTIFICATE UNDER 37 CFR §1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: **MS AMENDMENT** Commissioner for Patents, P.O. BOX 1450, Alexandria, VA 22313-1450 on this 31st day of March, 2006.

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